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IS 10233 (1982): Tractor-operated Disc Ploughs [FAD 21:
Farm Implements and Machinery]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
SPECIFICATION FOR
TRACTOR-OPERATED DISC PLOUGHS

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Indian Standard

SPECIFICATION FOR TRACTOR-OPERATED DISC PLOUGHS

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Indian Standard

SPECIFICATION FOR TRACTOR-OPERATED DISC PLOUGHS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 July 1982, after the draft finalized by the Soil Working Equipment Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Disc ploughs are commonly used with agricultural tractors for primary tillage operation. With the increased manufacture and use of disc ploughs in the country, a need was felt to prepare an Indian Standard on the subject to help in quality production of the ploughs. This standard is expected to fulfil this need.

0.3 In preparation of this standard, assistance has been derived from Uttar Pradesh State Agro-Industrial Corporation Workshop, Lucknow.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off values should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies material and other requirements for tractor-operated disc ploughs.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in **2.1.1.4** **2.1.2.1** to **2.1.2.7** and **2.1.3.37** to **2.1.3.39** of IS : 9818 (Part I)-1981† shall apply.

*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to tillage and intercultivation equipment: Part II Terms relating to equipment.

3. MATERIAL

3.1 The material used for different components of the disc plough, except disc, shall be as given in col 3 of Table 1. The material may conform to the relevant Indian Standards given in col 4 of Table 1.

TABLE 1 MATERIALS FOR DIFFERENT COMPONENTS OF DISC PLOUGH

SL No.	NAME OF PART	MATERIAL	APPLICABLE STANDARD
(1)	(2)	(3)	(4)
i)	Frame	Mild steel	IS : 226-1975*
ii)	Disc flange holder	Carbon steel forging, Cast steel	IS : 2004-1978† IS : 1030-1974‡
iii)	Scraper	Hot rolled steel	IS : 9442-1980§
iv)	Adjustment levers	Mild steel	IS : 226-1975*
v)	Furrow wheel and land wheel	Cast iron	IS : 210-1978
vi)	Loading platform	Mild steel	IS : 226-1975*
vii)	Cross bar/hitch	Mild steel	IS : 226-1975*
viii)	Loading mass	Cast iron	IS : 210-1978
ix)	Hitch pin	Carbon steel	IS : 1570 (Part II)- 1979¶

*Specification for structural steel (standard quality) (*fifth revision*).

†Specification for carbon steel forgings for general engineering purposes (*second revision*).

‡Specification for carbon steel castings for general engineering purposes (*second revision*).

§Specification for hot rolled steel plates, sheets and strips for manufacture of agricultural tillage discs.

||Specification for grey iron castings (*third revision*).

¶Schedules for wrought steel for general engineering purposes: Part II Carbon steels (unalloyed steels) (*first revision*).

3.2 The material for disc shall be in accordance with IS : 4366 (Part I)-1972*.

4. OTHER REQUIREMENTS

4.1 Discs — The discs used in disc ploughs shall conform to all the requirements, stipulated in IS : 4366 (Part I)-1972*. Plain or notched discs of 610 to 810 mm nominal size shall be used.

*Specification for agricultural tillage discs: Part I Concave type (*first revision*).

4.2 Frame — The frame shall be capable of sustaining a pull of 9.8 N per mm of nominal size of disc without permanent deflection or change in shape.

4.3 Scrapers — Each disc shall be provided with the scraper. The scrapers shall be set in such a way that they should not touch the face of disc. Arrangement for adjusting the gap of the scrapers shall be made.

4.4 Bearings — Tapered roller or ball bearings of suitable sizes shall be provided in disc holder, furrow wheel or land wheel. The bearings should be reasonably dust-proof and properly aligned.

4.5 Lubrication Arrangement — The arrangement for lubrication of moving parts shall be made. Provision of grease nipples (*see* IS : 4009-1967*) in plough bottom and wheels should be preferred.

4.6 Transport Wheels — In trailed-type disc ploughs, transport wheels may be provided for transportation of disc plough from one place to other.

4.7 Hitching Arrangements

4.7.1 In trailed-type disc ploughs, the drawbar should be manufactured in such a manner that it conforms to the requirements of tractor drawbar as given in IS : 4931-1977†.

4.7.2 In mounted-type disc ploughs, dimensions of hitch points should be such that they conform to the requirements of three-point linkage as given in IS : 4468-1977‡.

4.8 Angle Adjustment — The disc angle of the plough shall be $42 \pm 3^\circ$ and tilt angle shall be in the range of 15 to 25° .

4.9 Spring washer shall be provided with all the nut bolt fastenings.

4.10 Cross bar with crank position for hitching point shall be provided.

4.11 Trailing type ploughs shall be provided with a suitable mechanism for depth adjustment.

4.12 Operational and maintenance manuals and a set of tools including adjustable wrench and grease gun shall be provided.

5. FINISH AND WORKMANSHIP

5.1 The disc shall be finished as specified in IS : 4366 (Part I)-1972§.

*Specification for grease nipples.

†Specification for power take-off shaft of agricultural tractors (*first revision*).

‡Dimensions for three-point linkage of agricultural wheeled tractors (*first revision*).

§Specification for agricultural tillage discs: Part I Concave type (*first revision*).

5.2 The welding of the various parts shall be satisfactory in all respects (see 7.1 of IS : 822-1970*).

5.3 The components shall be free from pits, burrs and other visual defects.

5.4 The exposed metallic parts shall be free from rust and shall have a protective coating which will prevent surface deterioration in transit and storage.

6. MARKING AND PACKING

6.1 Marking — Each disc plough shall be marked with the following:

- a) Manufacturer's name and trade-mark, if any;
- b) Size of the disc; and
- c) Batch or code number.

6.1.1 These particulars shall be stamped embossed or engraved on metallic plate and rigidly fitted on a non-wearing part of the disc plough.

6.1.2 Each disc plough may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6.2 Packing — The disc plough shall be packed to ensure safety of the parts in transportation, as agreed to between the manufacturer and the purchaser.

7. SAMPLING AND CRITERIA FOR CONFORMITY

7.1 Unless otherwise agreed to between the purchaser and the supplier, the method of sampling and criteria for conformity of the disc ploughs shall be as given in 3 of IS : 7201-1974†.

*Code of procedure for inspection of welds.

†Methods of sampling of agricultural machinery and tractors.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	$N = 1 \text{ kg.m/s}^2$
Energy	joule	J	$1 \text{ J} = 1 \text{ N.m}$
Power	watt	W	$1 \text{ W} = 1 \text{ J/s}$
Flux	weber	Wb	$1 \text{ Wb} = 1 \text{ V.s}$
Flux density	tesla	T	$1 \text{ T} = 1 \text{ Wb/m}^2$
Frequency	hertz	Hz	$1 \text{ Hz} = 1 \text{ c/s (s}^{-1}\text{)}$
Electric conductance	siemens	S	$1 \text{ S} = 1 \text{ A/V}$
Electromotive force	volt	V	$1 \text{ V} = 1 \text{ W/A}$
Pressure, stress	pascal	Pa	$1 \text{ Pa} = 1 \text{ N/m}^2$